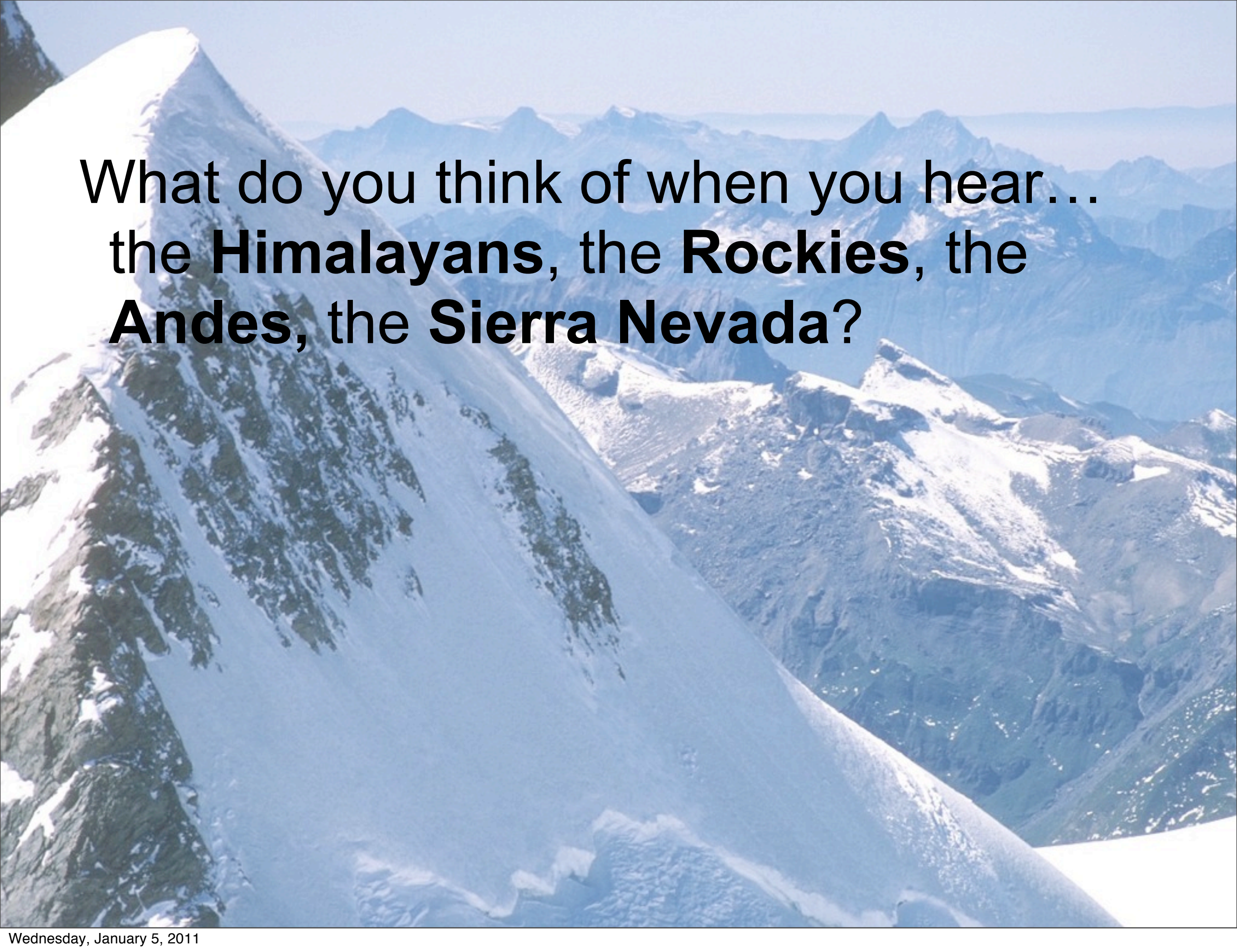




# Deformation of the Earth's Crust

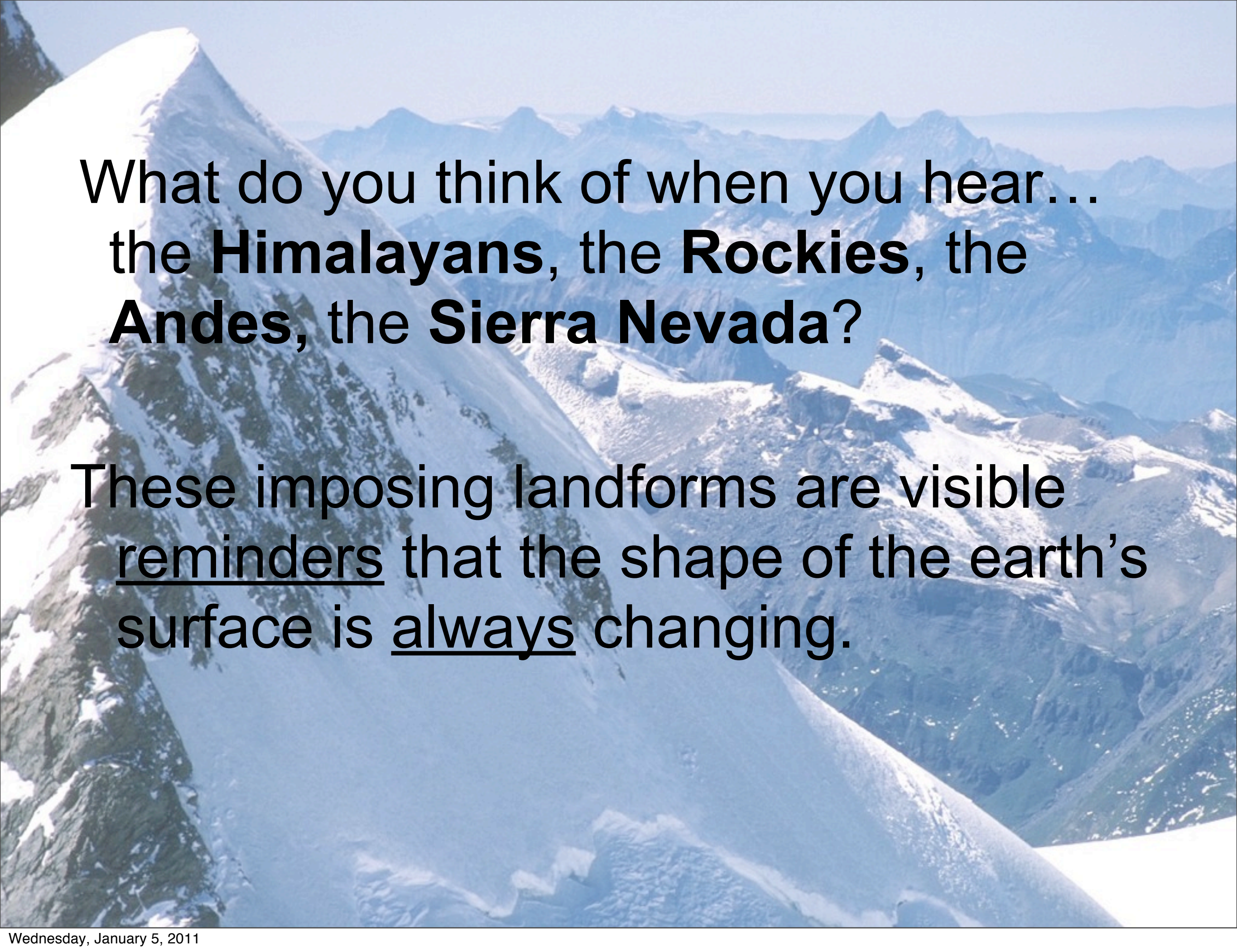
Mr. Silva



A high-altitude mountain landscape with snow-covered peaks and ridges under a clear blue sky. The foreground shows a steep, snow-covered slope with some rocky outcrops. In the background, a range of jagged mountain peaks stretches across the horizon.

What do you think of when you hear...  
the **Himalayans**, the **Rockies**, the  
**Andes**, the **Sierra Nevada**?





What do you think of when you hear...  
the **Himalayans**, the **Rockies**, the  
**Andes**, the **Sierra Nevada**?

These imposing landforms are visible  
reminders that the shape of the earth's  
surface is always changing.



# How the Crust is Deformed

- Deformation of the crust is the bending, tilting, and breaking of the earth's crust.
- Plate tectonics is the movement of the earth crust, but it's not the only force that shapes the earth's crust



# Isostatic Adjustment

- Isostatic adjustment occurs in the earth's crust because of the change in the weight in some parts of the crust.





# Isostatic Adjustment

- Isostatic adjustment occurs in the earth's crust because of the change in the weight in some parts of the crust.

Dictionary

**i•sos•ta•sy** |ī'sästəsē|  
noun Geology  
the equilibrium that exists between parts of the earth's crust, which behaves as if it consists of blocks floating on the underlying mantle, rising if material (such as an ice cap) is removed and sinking if material is deposited.

**DERIVATIVES**  
**i•so•stat•ic** |īsə'statik| adjective

**ORIGIN** late 19th cent.: from **iso-** [equal] + Greek **stasis** 'station.'





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Dictionary

**A** ad•just |ə'jəst|  
verb

1 [ trans. ] alter or move (something) slightly in order to achieve the desired fit, appearance, or result : *he smoothed his hair and adjusted his tie* | *the interest rate should be **adjusted for** inflation.*

- [ intrans. ] permit small alterations or movements so as to allow a desired fit, appearance, or result to be achieved : *a harness that **adjusts to** the correct fit.*
- [ intrans. ] adapt or become used to a new situation : *she must be allowed to grieve and to adjust in her own way* | *his eyes had **adjusted to** semidarkness.*

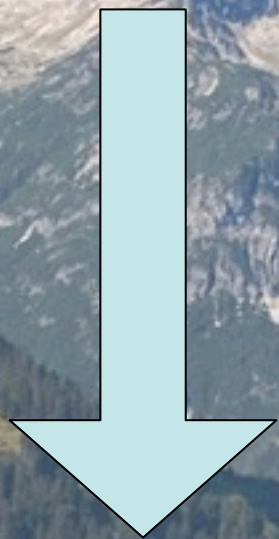
2 [ trans. ] assess (loss or damages) when settling an insurance claim.



# Isostatic Adjustment

- When crusts are thicker and heavier they move deeper into the mantle.

**SINKS**





# Isostatic Adjustment

- When crusts are thinner and lighter, it will rise higher on of the mantle.





# Isostatic Adjustment

- Take a second and think of a CARGO SHIP.





# Isostatic Adjustment

- This up-and-down movement in the crust occurs because of two opposing forces
- The crust is always trying to reach a balance.
- That balance is known as isostatic!



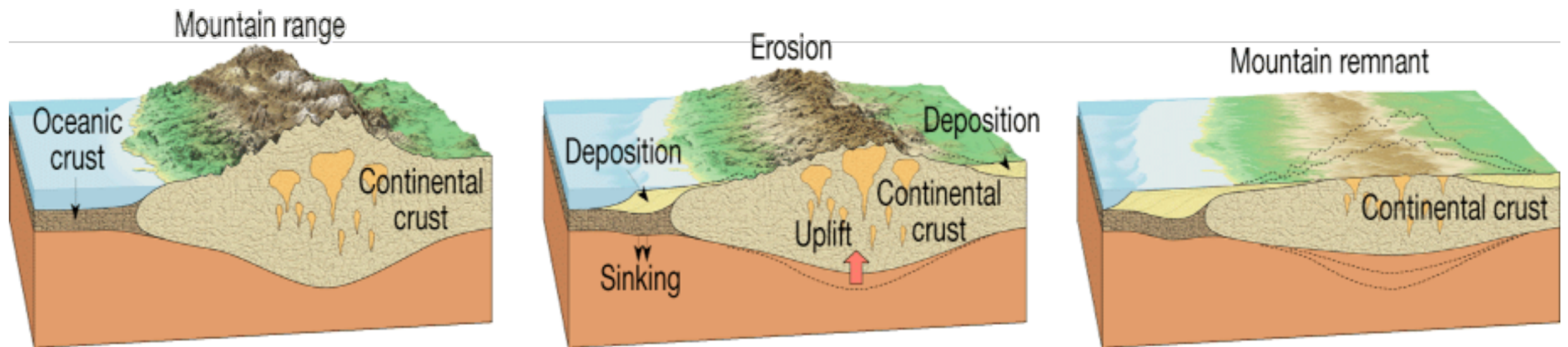
# Isostatic Adjustment

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**ISOSTATIC = BALANCE**



# Isostatic Adjustment





# Common Locations

- Isostatic adjustments are constantly occurring near:
  - Mountain ranges
  - Active volcanoes
  - Around glacier formations





# Stress on the Crust

- Plate movement causes STRESS on the earth's surface, or outermost crust.
- What is STRESS?





# Stress on the Crust

- Plate movement causes STRESS on the earth's surface, or outermost crust.
- What is STRESS?

Dictionary

stress |stres|  
noun

**S** 1 pressure or tension exerted on a material object : *the distribution of stress is uniform across the bar.*

- the degree of this measured in units of force per unit area.

2 a state of mental or emotional strain or tension resulting from adverse or very demanding circumstances : *he's obviously **under** a lot of **stress*** | [in combination] *stress-related illnesses.*

- something that causes such a state : *the stresses and strains of public life.*

3 particular emphasis or importance : *he has started to **lay** greater **stress on** the government's role in industry.*

4 emphasis given to a particular syllable or word in speech



# Stress on the Crust

- The crust becomes stressed when plates collide, separate or rub up on each other.

Collide

Rub

SEPARATE





# Quick Review

- At what plate boundary do plates *collide*?
- At what plate boundary to plates *separate*?
- At what plate boundary to plates *rub*?



# Quick Review

- At what plate boundary do plates *collide*?

## Convergent Plate Boundaries

- At what plate boundary to plates *separate*?
- At what plate boundary to plates *rub*?



# Quick Review

- At what plate boundary do plates *collide*?

## Convergent Plate Boundaries

- At what plate boundary to plates *separate*?

## Divergent Plate Boundaries

- At what plate boundary to plates *rub*?



# Quick Review

- At what plate boundary do plates *collide*?

## Convergent Plate Boundaries

- At what plate boundary to plates *separate*?

## Divergent Plate Boundaries

- At what plate boundary to plates *rub*?

## Transform Faults



# 3 Types of Stresses

- **Compression:** occurs when crustal rocks are squeezed together.
  - Often times reduces volume of rock
  - Will push rock higher up or deeper down into the crust





# 3 Types of Stresses

- **Tension:** is the force that pulls the rocks apart.
  - Tend to become thinner.





# 3 Types of Stresses

- **Shearing:** pushes rocks in the opposite horizontal direction.
  - Rocks can bend, twist, or break apart as they slide past each other.

